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INTERNATIONAL PRELIMINARY EXAMINATION REPORT  
(PCT Article 36 and Rule 70)

Applicant's or agent's file reference PH0274-PCT	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/PEA/416)	
International application No. PCT/GB 03/04026	International filing date (day/month/year) 18.09.2003	Priority date (day/month/year) 27.09.2002
International Patent Classification (IPC) or both national classification and IPC C07B59/00		
Applicant HAMMERSMITH IMANET LTD.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 7 sheets, including this cover sheet.  
  
☐ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).  
  
 These annexes consist of a total of sheets.

3. This report contains indications relating to the following items:
  - ☒ Basis of the opinion
  - ☐ Priority
  - ☒ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
  - ☒ Lack of unity of invention
  - ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
  - ☐ Certain documents cited
  - ☐ Certain defects in the international application
  - ☐ Certain observations on the international application

Date of submission of the demand  04.03.2004	Date of completion of this report  13.01.2005
Name and mailing address of the international preliminary examining authority:   European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016	Authorized Officer  Diederen, J  Telephone No. +31 70 340-1097



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**I. Basis of the report**

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

**Description, Pages**

1-9 as originally filed

**Claims, Numbers**

1-10 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).  
☐ the language of publication of the international application (under Rule 48.3(b)).  
☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.  
☐ filed together with the international application in computer readable form.  
☐ furnished subsequently to this Authority in written form.  
☐ furnished subsequently to this Authority in computer readable form.  
☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.  
☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:  
☐ the claims, Nos.:  
☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

*(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)*

6. Additional observations, if necessary:

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**III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability**

1. The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been examined in respect of:
- ☐ the entire international application,
  - ☒ claims Nos. 8
- because:
- ☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (specify):
  - ☐ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. are so unclear that no meaningful opinion could be formed (*specify*):
  - ☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.
  - ☒ no international search report has been established for the said claims Nos. 8
2. A meaningful international preliminary examination cannot be carried out due to the failure of the nucleotide and/or amino acid sequence listing to comply with the standard provided for in Annex C of the Administrative Instructions:
- ☐ the written form has not been furnished or does not comply with the Standard.
  - ☐ the computer readable form has not been furnished or does not comply with the Standard.

**IV. Lack of unity of invention**

1. In response to the invitation to restrict or pay additional fees, the applicant has:
- ☐ restricted the claims.
  - ☐ paid additional fees.
  - ☐ paid additional fees under protest.
  - ☐ neither restricted nor paid additional fees.
2. ☒ This Authority found that the requirement of unity of invention is not complied with and chose, according to Rule 68.1, not to invite the applicant to restrict or pay additional fees.
3. This Authority considers that the requirement of unity of invention in accordance with Rules 13.1, 13.2 and 13.3 is
- ☐ complied with.
  - ☐ not complied with for the following reasons:
4. Consequently, the following parts of the international application were the subject of international preliminary examination in establishing this report:
- ☒ all parts.

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☐ the parts relating to claims Nos. .

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability;  
citations and explanations supporting such statement**

**1. Statement**

Novelty (N)	Yes: Claims	1-7,9,10
	No: Claims	
Inventive step (IS)	Yes: Claims	1-6,9,10
	No: Claims	7
Industrial applicability (IA)	Yes: Claims	1-7,9,10
	No: Claims	

**2. Citations and explanations**

**see separate sheet**

Reference is made to the following documents:

- D1: J. VCELAK ET AL.: "The exchange of fluorine in (gamma-fluoropropyl)trialkylsilanes and n-heptyl fluoride for halogens of grignard reagents" COLLECTION CZECHOSLOV. CHEM. COMMUN., vol. 41, 1976, pages 131-9, XP0008028871
- D2: J. VCELAK ET AL.: "19F-NMR spectra of (Fluoroalkyl)-Substituted Silanes" COLLECTION CZECHOSLOV. CHEM. COMMUN., vol. 41, 1976, pages 386-390, XP0008028870
- D3: V.B. PUCHNAREVIC ET AL.: "Synthesis of gamma-fluoropropyl Substituted Silanes" COLLECTION CZECHOSLOV. CHEM. COMMUN., vol. 39, 1974, pages 2616-2620, XP0008028872
- D4: JP 02 290885 A (SHIN ETSU CHEM CO. LTD) 30 November 1990 (1990-11-30)

#### **Re Item IV**

#### **Lack of unity of invention**

The present application deals with two different problems and two different solutions. One problem is the provision of a process to prepare compounds of Formula (I). The solution proposed by the applicant is a reaction of compounds of Formula (II) or (IIa) with a compound of Formula (III) to yield compounds of Formula (I). For this process compounds (II) and (IIa) are needed and claimed and of which compounds (II) are not novel (see D1-D4). The second problem is the provision of a process for the preparation of known compounds (II) and (IIa). The solution as proposed by the applicant is a reaction of compounds of Formula (IV) with a source of fluoride to yield compounds of Formula (II) or (IIa). For this process compounds of Formula (IV) are needed and are also claimed.

The subjects of this application are therefore as follows:

1. Process for the preparation of a fluorohaloalkane of Formula (I) and (Ia) by reaction of compound (II) (or IIa) with (III); compounds of formula (II) and (IIa) (Claims 1-6,8,9)
2. Process for the preparation of compounds of Formula (II) or (IIa) by reaction of compounds of Formula (IV) with a source of F<sup>-</sup>; compounds of Formula (IV) (Claims 7,10)

**Re Item V**

**Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 7 does not involve an inventive step in the sense of Article 33(3) PCT.

Claim 7 of the present application concerns a process for the preparation of formula (II) or (IIa) as defined in claim 1 or 2 by reaction of a compound of formula (IV) with a source of  $F^-$  in the presence of a phase transfer catalyst.

Documents D1-D4 all describe reactions of compounds of Formula (II) with a source of  $F^-$ . This shows that compounds of Formula (II) are not novel.

Document D1 describes in the experimental part the synthesis of (gamma-fluoropropyl)triethylsilane by reaction of (gamma-chloropropyl)triethylsilane with potassium fluoride.

Document D2 describes on page 387, the synthesis of fluoromethyltrimethylsilane by reaction of (tosylatemethyl)trimethylsilane with potassium fluoride. On the same page of D2, the synthesis of (epsilon-fluoropentyl)trimethylsilane is described by reaction of fluorination of (epsilon-hydroxypentyl)trimethylsilane with Yarovenko reagent  $(CFCIHC_2F_2N(C_2H_5)_2)$ .

Document D3 discloses on page 2619 the synthesis of (gamma-fluoropropyl)trimethylsilane by reaction of Yarovenko reagent with (gamma-hydroxypropyl)trimethylsilane.

Document D4 discloses the preparation of compounds of Formula I ( $R^1R^2R^3SiCH_2F$ ) by reaction of compounds of Formula (III) ( $R^1R^2R^3SiCH_2Cl$ ) with a source of fluoride (e.g.  $CsF$ ,  $KF$ ).

The difference of these disclosures with the subject-matter of claim 7 is the fact that in claim 7 a phase transfer catalyst is used. A skilled person, starting from documents D1, D2, D3 or D4 would immediately recognise that in the presence of a phase transfer catalyst, substitution reactions with these polar compounds (e.g.  $KF$ ) would be

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facilitated as it is general knowledge that such polar compounds do not dissolve very well in organic solvents and that in the presence of such phase transfer catalysts the polar compounds are more susceptible for organic reactions. A skilled person would therefore use phase transfer catalysts in this type of reaction without the use of an inventive skill. It is therefore concluded that the subject-matter of claim 7 is not considered to involve an inventive step over the prior art with respect to Article 33(3) PCT.